Claims

1. A flow control device, comprising:

(a) a cap member configured and dimensioned for cooperation with a fluid container, said cap member including a plurality of circumferentially spaced ratchet teeth defined on an inner surface thereof;

(b) an overcap movably mounted with respect to said cap member, said overcap defining a central opening and including at least one tooth defined on an inner surface thereof, said at least one tooth being positioned so as to engage said ratchet teeth as said overcap is mounted relative to said cap member; and

(c) a ball positioned within said overcap, said ball being sized to obstruct fluid passage through said central opening;

wherein a variable flow clearance may be established by movement of said overcap relative to said cap member.

2. A flow control device according to claim 1, wherein said ratchet teeth extend for an angular distance of about 270° relative to said inner surface of said cap member.

3. A flow control device according to claim 1, wherein said ratchet teeth extend around the entire circumference of said inner surface of said cap member.

4. A flow control device according to claim 3, further comprising a stop tooth positioned between an adjacent pair of ratchet teeth.

5. A flow control device according to claim 1, wherein said ratchet teeth extend for substantially the entire circumference of said inner surface of said cap member, and wherein a clearance gap is defined between an adjacent pair of ratchet teeth.

6. A flow control device according to claim 5, wherein said clearance gap extends for an angular distance of about 10^{o}.

7. A flow control device according to claim 1, wherein at least one thread is defined on said inner surface of said cap member.

8. A flow control device according to claim 7, wherein double threads are defined on said inner surface of said cap member.

9. A flow control device according to claim 7, wherein said at least one thread is spaced from said ratchet teeth.

10. A flow control device according to claim 7, further comprising an indicator on an exterior surface of said overcap that is substantially aligned with a reference marker defined on an exterior surface of said cap member when said overcap is brought into engagement with said cap member.

11. A flow control device according to claim 1, further comprising a sealing member positioned between said overcap and said cap member.

12. A flow control device according to claim 11, wherein said sealing member is selected from the group consisting of a washer, an O-ring and a gasket.

13. A flow control device according to claim 11, wherein said sealing member includes a raised surface defined on said cap member, said raised surface cooperating with said overcap to enhance sealing therebetween.

14. A flow control device according to claim 1, wherein at least one said plurality of ratchet teeth includes a tapered geometry.

15. A flow control device according to claim 14, wherein each of said plurality of ratchet teeth includes a tapered geometry.

16. A flow control device according to claim 14, wherein each of said plurality of ratchet teeth defines a top end and a bottom end, and wherein said tapered geometry includes an outward taper from said top end to said bottom end.

17. A flow control device according to claim 1, further comprising a plurality of ridges defined on external surfaces of said overcap and cap member, and wherein said plurality of ridges define a substantially triangular cross-section.

18. A flow control device according to claim 1, wherein said movement is effected, at least in part, by rotational motion of said overcap relative to said cap member.

19. A flow control device according to claim 1, wherein said movement is effected, at least in part, by axial motion of said overcap relative to said cap member.

20. A flow control device according to claim 1, further comprising a fluid container mounted with respect to said cap member.

21. A flow control device according to claim 20, wherein said fluid container is detachably mounted with respect to said cap member.

22. A flow control device, comprising:

(a) a cap member configured and dimensioned for cooperation with a fluid container that defines a longitudinal axis;

(b) an overcap movably mounted with respect to said cap member, said overcap defining a central opening; and

(c) a pair of balls captured within said overcap, said balls being sized to obstruct fluid passage through said central opening;

wherein said overcap defines an angular geometry such that said central opening is angularly oriented relative to said longitudinal axis.

23. A flow control device according to claim 22, wherein said angular geometry corresponds to an angle of about 30° to about 60° relative to said longitudinal axis.

24. A flow control device according to claim 22, wherein said overcap includes a first overcap member and a second overcap member, and wherein said first and second overcap members are joined to each other.

25. A flow control device according to claim 22, wherein said overcap includes at least one mounting flange defined therewithin and wherein one of said pair of balls engages said at least one mounting flange.

26. A flow control device according to claim 25, wherein said one of said pair of balls sealingly engages said at least one mounting flange.

27. A flow control device according to claim 25, wherein a pair of mounting flanges are defined within said overcap and wherein said one of said pair of balls is captured between said pair of mounting flanges.

28. A flow control device according to claim 27, wherein said pair of mounting flanges comprises an upper mounting flange and a lower mounting flange, and wherein said captured ball is adapted to be moved into sealing engagement with said lower mounting flange.

29. A flow control device according to claim 22, wherein said pair of balls are in contact with each other.

30. A flow control device according to claim 29, wherein movement of a first of said pair of balls translates to corresponding motion of a second of said pair of balls.

31. A flow control device according to claim 22, wherein at least one of said balls is positioned and dimensioned to seal within said central opening.

32. A flow control device according to claim 22, wherein motion of said overcap relative to said cap member causes said pair of balls to bear against each other and brings one of said balls into sealing engagement with said central opening.

33. A flow control device according to claim 22, wherein a variable flow clearance may be established by motion of said overcap relative to said cap member.

34. A flow control device according to claim 33, wherein said motion of said overcap relative to said cap member is effected, at least in part, by rotational motion of said overcap relative to said cap member.

35. A flow control device according to claim 33, wherein said motion of said overcap relative to said cap member is effected, at least in part, by axial motion of said overcap relative to said cap member.

36. A flow control device according to claim 22, further comprising a mounting flange defined in said cap member, and wherein motion of said overcap relative to said cap member causes one of said balls to sealingly engage said mounting flange.

37. In combination:

(a) a fluid container that defines a first fluid region and a second fluid region separated by a dividing wall from said first fluid region, wherein each of said first and second fluid regions communicates with a fluid dispensing opening; and

(b) a flow control device that is detachably mounted with respect to at least one of said fluid dispensing openings, said flow control device including: (i) a cap member configured and dimensioned for cooperation with said at least one fluid dispensing opening; (ii) an overcap movably mounted with respect to said cap member, said overcap defining a central opening; and (iii) a ball positioned within said overcap, said ball being sized to obstruct fluid passage through said central opening;

wherein a variable flow rate from said fluid container through said at least one fluid dispensing opening may be established by movement of said overcap relative to said cap member.

38. The combination according to claim 37, wherein said fluid container is substantially crescent-shaped.

39. The combination according to claim 37, wherein said fluid container defines a cross-section that is substantially hour-glass shaped.

40. The combination according to claim 37, wherein said at least one fluid dispensing opening defines a threaded neck that is configured and dimensioned to cooperate with a corresponding thread formed within said cap member.

41. The combination according to claim 37, further comprising a second flow control device that is detachably mounted with respect to a second of said fluid dispensing opening.

42. The combination according to claim 37, wherein said movement of said overcap relative to said cap member is effected, at least in part, by rotational motion of said overcap relative to said cap member.

43. The combination according to claim 37, wherein said movement of said overcap relative to said cap member is effected, at least in part, by axial motion of said overcap relative to said cap member.

44. The combination according to claim 37, wherein said overcap includes a first overcap member and a second overcap member, and wherein said first and second overcap members are joined to each other.

45. The combination according to claim 37, wherein said overcap includes at least one mounting flange defined therewithin and wherein one of said pair of balls engages said at least one mounting flange.

46. The combination according to claim 45, wherein said one of said pair of balls sealingly engages said at least one mounting flange.

47. The combination according to claim 45, wherein a pair of mounting flanges are defined within said overcap and wherein said one of said pair of balls is captured between said pair of mounting flanges.

48. The combination according to claim 47, wherein said pair of mounting flanges comprises an upper mounting flange and a lower mounting flange, and wherein said captured ball is adapted to be moved into sealing engagement with said lower mounting flange.

49. The combination according to claim 37, wherein said pair of balls are in contact with each other.

50. The combination according to claim 37, wherein movement of a first of said pair of balls translates to corresponding motion of a second of said pair of balls.

51. The combination according to claim 37, wherein at least one of said balls is positioned and dimensioned to seal within said central opening.

52. The combination according to claim 37, wherein motion of said overcap relative to said cap member causes said pair of balls to bear against each other and brings one of said balls into sealing engagement with said central opening.

53. A flow control device comprising:

(a) a cap member configured and dimensioned for cooperation with a fluid container;

(b) an overcap movably mounted with respect to said cap member, said overcap defining a central opening; and

(c) a pair of balls captured between said cap member and said central opening of said overcap, at least one of said pair of balls being sized to obstruct fluid passage through said central opening;

wherein a variable flow clearance may be established by movement of said overcap relative to said cap member.

54. A flow control device according to claim 53, wherein said overcap includes a first overcap member and a second overcap member, and wherein said first and second overcap members are joined to each other.

55. A flow control device according to claim 53, wherein said overcap includes at least one mounting flange defined therewithin and wherein one of said pair of balls engages said at least one mounting flange.

56. A flow control device according to claim 55, wherein said one of said pair of balls sealingly engages said at least one mounting flange.

57. A flow control device according to claim 55, wherein a pair of mounting flanges are defined within said overcap and wherein said one of said pair of balls is captured between said pair of mounting flanges.

58. A flow control device according to claim 57, wherein said pair of mounting flanges comprises an upper mounting flange and a lower mounting flange, and wherein said captured ball is adapted to be moved into sealing engagement with said lower mounting flange.

59. A flow control device according to claim 53, wherein said pair of balls are in contact with each other.

60. A flow control device according to claim 59, wherein movement of a first of said pair of balls translates to corresponding motion of a second of said pair of balls.

61. A flow control device according to claim 53, wherein at least one of said balls is positioned and dimensioned to seal within said central opening.

62. A flow control device according to claim 53, wherein motion of said overcap relative to said cap member causes said pair of balls to bear against each other and brings one of said balls into sealing engagement with said central opening.

63. A flow control device according to claim 53, wherein said motion of said overcap relative to said cap member is effected, at least in part, by rotational motion of said overcap relative to said cap member.

64. A flow control device according to claim 53, wherein said motion of said overcap relative to said cap member is effected, at least in part, by axial motion of said overcap relative to said cap member.

65. A flow control device according to claim 53, further comprising a mounting flange defined in said cap member, and wherein motion of said overcap relative to said cap member causes one of said balls to sealingly engage said mounting flange.

66. A flow control device according to claim 65, further comprising a second mounting flange defined within said overcap and spaced from said first mounting flange, said first and second mounting flanges capturing one of said pair of balls therebetween.

67. In combination:

(a) a fluid container including an opening for fluid passage; and

(b) a flow control device comprising: (i) a cap member configured and dimensioned for cooperation with said fluid container; (ii) an overcap movably mounted with respect to said cap member, said overcap defining a central opening; and (iii) a pair of balls captured between said cap member and said central opening of said overcap, at least one of said pair of balls being sized to obstruct fluid passage through said central opening;

wherein a variable flow clearance may be established by moving said overcap relative to said cap member.

68. A fluid container, comprising:

(a) an outer wall that defines an interior region;

(b) an internal dividing wall within said interior region, said internal dividing wall defining a first fluid region and a second fluid region;

(c) a first fluid dispensing opening defined in said outer wall, said first fluid dispensing opening in communication with said first fluid region; and

(d) a second fluid dispensing opening defined in said outer wall, said second fluid dispensing opening in communication with said second fluid region.

69. A fluid container according to claim 68, wherein at least a portion of said outer wall defines a crescent-shaped geometry.

70. A fluid container according to claim 68, wherein at least a portion of said outer wall defines a cross-section having an hour-glass geometry.